

Symptoms of depression among community-dwelling elderly African-American and White older adults

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ABSTRACT

Background. Few studies have explored the variance in individual symptoms by race in older adults.

Methods. Data were analysed from the Duke site of the Established Populations for Epidemiologic Studies of the Elderly (EPESE), a community sample of persons 65 years-of-age and older, 54% of whom were African-Americans. Of the 3401 subjects with adequate data on depressive symptomatology, confirmatory factor analysis and LISREL were first used to confirm the presence of the factor structure previously reported for the CES-D. Next, bivariate analysis was performed to determine the prevalence of individual symptoms by race. Finally, LISREL analysis was performed to control for potential confounding variables.

Results. When bivariate comparisons of specific symptoms by race were explored, African-Americans were more likely to report less hope about the future, poor appetite, difficulty concentrating, requiring more effort for usual activities, less talking, feeling people were unfriendly, feeling disliked by others and being more 'bothered' than usual. When LISREL analyses were applied to these data (controlling for education, income, cognitive impairment, chronic health problems and disability and other factors) racial differences in somatic complaints and life satisfaction disappeared, yet differences in interpersonal relations persisted.

Conclusions. This study confirms earlier findings of minimal overall differences in symptom frequency between African-American and non-African-American community-dwelling older adults in controlled studies.

INTRODUCTION

A number of community-based epidemiological studies have estimated the prevalence of depressive symptoms and depressive diagnoses by race/ethnicity among older adults (Comstock & Helsing, 1976; Blazer & Williams, 1980; Murrell *et al.* 1983; Berkman *et al.* 1986; Smallegan, 1989; Weissman *et al.* 1991). Most of these studies found few differences in either the symptom frequency or the diagnostic frequency of major depression between African-American and White older adults, even before adjustment of control factors such as income and education.

For example, Murrell and colleagues (1983) found, when using the Center for Epidemiologic Studies Depression Scale (CES-D) in a sample of over 2000 community-dwelling adults 55 years-of-age and older in Kentucky, that the mean score on the CES-D was 8.9 for African-Americans and 9.2 for Whites. When they applied typical 'cut-off' for clinically significant depressive symptoms, 12.8% of African-Americans and 13.7% of Whites had clinically-significant depressive symptoms (Radloff, 1997). Berkman *et al.* (1986) found that 16% of both African-Americans and Whites in an urban community scored above the threshold for clinically significant depressive symptoms on the CES-D.

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Blazer & Williams (1980) did not find significant differences between African-American and White elders in an urban community-based survey of 1000 adults for dysphoria, major depression or medically-related depression. Weissman *et al.* (1991) reporting overall results from the Epidemiologic Catchment Area (ECA) Study, found the 1-month prevalence of major depression for African-Americans to be 3.3% and 3.7% for Whites. Prevalence for both African-Americans and Whites was lower in late life (approximately 1%) but did not vary by race/ethnicity. In contrast, there was a slight but statistically significant lower rate for mood disorders among African-Americans in the 30–64 age group in the ECA study.

Depression, however, is not a unitary construct. Beck (1967) categorized symptoms of depression into four distinct categories: emotional, cognitive, physical and volitional symptoms. The disaggregation of the construct of depression into distinct domains is reflected in DSM-IV (APA, 1994). In addition to 'specifiers' for outcome and course, such as major depression with a seasonal pattern or rapid cycling, depression is also specified according to catatonic, melancholic and atypical features (such as weight gain, hypersomnia and a long-standing pattern of interpersonal rejection sensitivity). Blazer *et al.* (1988) applied a cluster analytical approach to disaggregating depressive symptoms in a community population assessed for symptoms of DSM-III major depression (the ECA study) and found five patterns of presentation of depressive symptoms including a pattern nearly identical to the symptoms of DSM-IV, a pattern which combined vegetative symptoms with cognitive impairment, a pattern congruent with the construct of minor depression, a pattern congruent with late luteal phase dysphoric disorder and a mixed anxiety and depression pattern. These findings suggest that, even when a specific diagnosis is assessed using a standardized interview, multiple symptom clusters may emerge.

The disaggregation of depressive symptoms, however, has been most frequently applied to the CES-Depression Scale in community-based epidemiological studies. This scale, in numerous studies, has been factor-analysed into four discrete factors: depressive affect; positive affect or life satisfaction; poor interpersonal relations;

and somatic complaints. (Radloff, 1977; Ross & Morowsky, 1984; Kohout *et al.* 1993). These factor structures have been replicated in studies of older populations (most of which have been predominantly White) (Berkman *et al.* 1986; Kohout *et al.* 1993).

Despite the absence of race/ethnic differences overall, the relative frequency and distribution of domains of depressive symptoms may vary by race/ethnicity. In the ECA study, though overall prevalence did not vary significantly by race/ethnicity, when individual symptoms were compared by race/ethnicity, some significant differences emerged. African-Americans were more likely to report appetite change and psychomotor change whereas Whites were more likely to report changes in sleep, fatigue, guilt, diminished concentration and thoughts of death when the lifetime prevalence of symptoms reported was ascertained. (Weissman *et al.* 1991) Callahan & Wolinsky (1994) employed the CES-D in a primary-care setting treating older adult and found factor differences across gender and race/ethnicity.

Though overall levels of symptoms of depression may not vary significantly by race/ethnicity in community populations, the risk factors for these symptoms may vary. For example, Jones-Webb & Snowden (1993) found that African-Americans who were 30 to 39 years of age, who belonged to non-Western religious groups and who lived in the West were at greater risk for depressive symptoms than Whites. In contrast, African-Americans who were widowed, members of the middle and lower middle class, and unemployed were at lower risk than Whites in comparable situations. Brown *et al.* (1995) found young age and fair-to-poor physical health were more powerful risk factors for major depression among African-Americans than other demographic, sociocultural and family background variables (in contrast to Whites). Williams *et al.* (1992) found the association between marital status and psychiatric disorders to be stronger in Whites than observed for African-Americans. Separated/divorced African-American men, widowed African-American women, and never-married African-American men were worse off than their respective peers. In a further study, Brown *et al.* (1992) found that symptoms of depression among older African-Americans did not follow a pattern

generally seen in community populations, i.e. increased frequency of depression among females. The lack of gender difference in this study was attributed to similarities and risk factors such as stressful life events and social roles associated with employment and child rearing among this group of older African-Americans.

Even though the overall frequency of depressive symptoms in a community-based sample of older adults may be similar by race/ethnicity, neither the pattern of symptom presentation nor the correlates of depressive symptoms may be similar. In other words, simple reports comparing frequency of symptoms by race/ethnicity fail to present an accurate picture of racial and ethnic diversity in depressive symptomatology. We, therefore, asked four questions about depressive symptoms in a racially-mixed sample of community-dwelling older adults: (1) Does the previously reported factor structure for the CES-D persist overall in this racially mixed sample?; (2) Is the factor structure for the CES-D similar for African-Americans and Whites?; (3) Is the frequency of individual depressive symptoms similar for African-Americans and Whites?; and (4) If the frequencies of individual symptoms and domains of symptoms vary by race/ethnicity between African-Americans and Whites, can these racial variations be explained by covariance with other known factors for depression?

METHOD

Sample

The data from this study derive from the Duke site of the Established Populations for Epidemiologic Studies of the Elderly Project (EPESE) (Cornoni-Huntley *et al.* 1990; Blazer *et al.* 1991). The Duke sample of this multi-centre collaborative epidemiological investigation of older adults consists of 4162 community residents aged 65 years and older from five contiguous counties in North Carolina – Durham, Granville, Vance, Warren and Franklin counties of North Carolina. Durham county is predominantly urban whereas the remaining four counties are predominantly rural. African-Americans were oversampled and represent 54% of the unweighted sample and 35% of the weighted or adjusted sample. Virtually all non-African-Americans were White and will be

referred to as ‘White’ throughout. In the analyses, sampling weights were used to adjust for the oversample, differential sampling probabilities by household size, and non-response. One hundred and sixty-two interviews were proxy and were excluded from these analyses. Also excluded were 599 respondents with missing data on one or more of the depression items, leaving an analysis sample of 3401.

Measures

Depressive symptoms were measured with the 20-item CES-D. (Radloff, 1977). Based on prior factor analytical studies, four factors or domains of depressive symptoms have been demonstrated: depressed affect; positive affect or life satisfaction; somatic complaints and interpersonal problems (Radloff, 1977; Berkman *et al.* 1986; Herzog *et al.* 1990; Kohout *et al.* 1993; McCallum *et al.* 1995). In the Duke EPESE, the CES-D response options were modified and assess the presence or absence of a symptom during the week prior to the interview. The dichotomous scale has been compared to the standard form of the CES-D (four response options) and a score of ≥ 9 on the Duke scale is equivalent to a score of ≥ 16 on the original scale with a very high correlation across all scores. (Blazer *et al.* 1991). The items were read to respondents who replied ‘yes’ or ‘no’ to the 20 questions.

The following measures were included as control variables in the regression models: cognitive impairment based on the Short Portable Mental Status Questionnaire (Pfeiffer, 1975); household income; age; gender; education; self-report chronic health problems (self-report of chronic health problems such as diabetes, coronary heart disease and cancer) (Fillenbaum *et al.* 1993); and disability according to a composite scale of three frequently-used disability scales, a total of 15 items (Rosow & Breslau, 1966; Katz & Akpon, 1976; Nagi, 1976). Marital status was included in earlier models but not the final model, as it did not change the findings and the smaller model was more parsimonious. Mean imputations were used for independent variables with less than 2% of the answers missing. For items with 2 to 5% missing data, we imputed a regression-predictive score based on the other independent variables in the regression model. Missing data

on the CES-D was unrelated to race/ethnicity or gender. Only income, which was missing for 19% of respondents, had more than 5% missing data. To impute income, we used stochastic regression techniques (Little & Rubin, 1971; Kelton & Kespriz, 1986). Stochastic imputation (the imputation of an error term along with a regression-predicted score) is designed to estimate the variance as well as the mean of the imputed variable with accuracy, and therefore minimize bias in relevant tests of significance. For income, the significance tests were adjusted to reflect the number of nonmissing cases prior to imputation.

Statistics

We used Joreskog and Sorbon's PRELIS (Joreskog & Sorbon, 1988) and LISREL (Joreskog and Sorbon, 1989) programs to perform a confirmatory factor analysis based on the factor structure which has been described above. Unlike exploratory factor analysis, confirmatory factor analysis permits one to: force items to load only on those factors specified by the hypothesized factor structure; test whether the estimated factor loadings and inter-factor correlations are statistically significant; and use a variety of fit indices and matrices based on residual covariances to determine the fit of the hypothesized model to the data. Unlike Radloff, 1977) and Kohout *et al.* (1993) we permitted correlations among depression factors. The expectation that four depression factors are uncorrelated is not plausible given relevant theory and previous studies. Forcing correlated factors to be orthogonal tends to obscure the underlying factor structure, as inter-factor correlations are manifested by relevant items loading on more than one factor. This is the case in the results reported by Kohout *et al.* (1993), where 12 of 20 depression items load (at 0.20 or more) on more than one factor. The factor loadings are unstandardized.

To determine whether the different domains of depression, i.e. the four factors of the CES-D, relate differently to risk factors, these domains were regressed on several demographic and social risk factors. To test whether the effects of each risk factor were significantly different across dimensions, we used the SAS 1990 (PROC CALIS) version of LISREL, which allows sampling weights. An initial 'saturated' model

was estimated where the effects of all predictors were allowed to vary across the four dimensions of depression. For each predictor, an additional model was then estimated in which its unstandardized effect was constrained to be equal across outcomes. For each model, the depression subscales were allowed to correlate with one another. The difference in fit for the two models (based on the logs of their likelihood functions) was distributed as chi-squared and provided a significance test of whether the hypothesis of equal effects across outcomes was consistent with the data. Because complex design adjustments are not at present available for LISREL or Proc CALIS, we were unable to adjust our significance test for clustering and stratification in the sampling design.

RESULTS

Overall, the mean standard deviation score for the modified CES-D was 2.77 (3.17). They were 3.14 (2.55) for African-Americans and 2.57 (3.76)

Table 1. *Hypothesized factor structure based on Kohout et al. (1993)*

Items coded 'yes' or 'no' (Abbreviation)	
Factor 1	Depressed affect
cesd1	I was bothered by things that don't usually bother me (Bothered)
cesd3	I felt I could not shake the blues (Blues)
cesd6	I felt depressed (Depressed)
cesd14	I felt lonely (Lonely)
cesd17	I had crying spells (Crying)
cesd18	I felt sad (Sad)
Factor 2	Positive affect (low)
cesd4	I felt as good as other people (Good)
cesd8	I felt hopeful about the future (Hopeful)
cesd9	I thought my life had been a failure (Failure)
cesd12	I was happy (Happy)
cesd16	I enjoyed life (Enjoyed)
Factor 3	Somatic complaints
cesd1	I was bothered by things that don't usually bother me (Bothered)
cesd2	I did not feel like eating; my appetite was poor (Appetite)
cesd5	I had trouble keeping my mind on what I was doing (Mind)
cesd6	I felt depressed (Depressed)
cesd7	I felt like everything I did was an effort (Effort)
cesd11	My sleep was restless (Sleep)
cesd13	I talked less than usual (Talk)
cesd20	I could not get 'going' (Going)
Factor 4	Interpersonal problems
cesd15	People were unfriendly (Unfriendly)
cesd19	I felt that people disliked me (Dislike)

cesd10 (I felt fearful). This did not load on any factor in Kohout *et al.* (1993) and is excluded from the analysis here.

Table 2. Final confirmatory factor analysis model for CES-D items in EPESE data. Results presented separately for all respondents (N = 3401), African-American respondents (N = 1848) and White respondents (N = 1553)

Item	Factor 1* Depressed affect			Factor 2 Positive affect			Factor 3 Somatic complaints			Factor 4 Interpersonal problems		
	All	(Afr.	White)	All	(Afr.	White)	All	(Afr.	White)	All	(Afr.	White)
Factor loadings												
1 Bothered	0.29	(0.38	0.25)				0.66	(0.60	0.66)			
2 Appetite							1.00	(1.00	1.00)†			
3 Blues	1.00	(1.00	1.00)†									
4 Felt good				1.00	(1.00	1.00)†						
5 Mind							0.94	(0.95	0.92)			
6 Depressed	1.09	(1.15	1.04)									
7 Effort							0.98	(0.84	1.15)			
8 Hopeful				1.02	(0.59	1.35)						
9 Failure				0.37	(0.38	0.40)	0.59	(0.68	0.47)	0.36	(0.30	0.45)
10 Fearful												
11 Sleep							0.91	(0.90	0.94)			
12 Happy				2.36	(2.65	2.14)						
13 Talk							1.01	(0.99	1.04)			
14 Lonely	0.96	(1.03	0.89)									
15 Unfriendly										1.00	(1.00	1.00)†
16 Enjoyed				1.86	(2.00	1.72)						
17 Crying	0.95	(1.03	0.88)									
18 Sad	1.04	(1.14	0.96)									
19 Disliked										1.06	(1.03	1.15)
20 Get going							1.12	(1.09	1.17)			
Interfactor correlations												
F1	1.0	(1.0	1.0)									
F2	0.58	(0.45	0.71)	1.0	(1.0	1.0)						
F3	0.82	(0.84	0.81)	0.51	(0.36	0.66)	1.0	(1.0	1.0)			
F4	0.65	(0.66	0.65)	0.32	(0.22	0.50)	0.59	(0.61	0.56)	1.0	(1.0	1.0)
Model fit												
	All respondents			African-Americans			Whites					
χ^2/df (P)	265.8/143 (< 0.001)			212.42/143 (< 0.001)			169.85/143 (0.06)					
Goodness-of-fit‡	0.995			0.993			0.994					
Adjusted goodness-of-fit‡	0.994			0.990			0.992					
Delta,§	0.988			0.982			0.986					

* For each factor: a column of results is presented first for all respondents: two additional (bracketed) columns present results for African-Americans and Whites respectively. All factor loadings and interfactor correlations are significant at $P > 0.05$ except: the loading for item 9 on factor 2 among African-Americans ($P < 0.10$) and the same loading among Whites ($P < 0.10$).

† For all respondents, African-American respondents and White respondents, these factor loadings were fixed to 1.00 to identify model.

‡ For goodness-of-fit and adjusted goodness-of-fit, see Joreskog & Sorbom (1989, p. 25ff).

§ For delta, see Bollen (1989, 275ff).

for Whites. The frequency of clinically significant depressive symptoms was 9% overall, 9.5% for African-Americans and 8.8% for Whites. Neither of these differences was statistically significant.

The hypothesized factor structure of the CES-D, based on previous studies, is presented in Table 1. In Table 2, we present the factor analytical results. The factor structure in Table 2 differs only slightly from the hypothesized model. The nine goodness-of-fit indices at the bottom of Table 2 all exceed 0.98, indicating an excellent fit of the model to the data among all

respondents, and among African-Americans and Whites separately. There is a high correlation between factor 1 and factor 3 (0.82 for all respondents) yet when we attempted to reduce the model to three factors, there was a substantial reduction in model fit.

With two exceptions, all of the factor loadings in Table 2 are statistically significant. For the item 'I thought my life had been a failure' there is a trend towards loading, but it did not reach statistical significance. This non-significance is probably due to distribution on this variable for few persons endorsed this variable. Two items,

Table 3. Percentage reporting the presence of each depression symptom (weighted percentages and unweighted Ns)

		Percentage reporting a symptom			χ^2/P
		Total % (N)	African-American %	White %	
Factor 1	Depressed affect				
cesd3	(Blues)	12.6 (463)	13.1	12.4	0.38/0.54
cesd6	(Depressed)	22.0 (809)	24.1	20.9	4.71/0.03
cesd14	(Lonely)	22.3 (871)	24.4	21.1	4.88/0.03
cesd17	(Crying)	6.8 (259)	7.2	6.7	0.31/0.58
cesd18	(Sad)	22.5 (815)	22.9	22.3	0.18/0.67
Factor 2	Positive affect (low)				
cesd4	(Good)	6.5 (218)	6.9	6.3	0.37/0.54
cesd8	(Hopeful)	19.5 (758)	26.6	15.7	58.6/0.000
cesd12	(Happy)	8.7 (307)	8.6	8.7	0.01/0.91
cesd16	(Enjoyed)	6.0 (207)	6.0	6.0	0.00/0.98
Factor 3	Somatic complaints				
cesd2	(Appetite)	15.8 (616)	20.5	13.3	29.5/0.00
cesd5	(Mind)	18.7 (699)	22.1	16.9	14.2/0.000
cesd7	(Effort)	25.4 (918)	29.3	23.3	14.6/0.000
cesd11	(Sleep)	23.1 (814)	22.0	24.2	1.99/0.16
cesd13	(Talk)	12.5 (451)	15.4	11.0	13.9/0.000
cesd20	(Going)	18.9 (672)	18.9	18.8	0.01/0.91
Factor 4	Interpersonal problems				
cesd15	(Unfriendly)	5.4 (233)	8.4	3.9	31.0/0.000
cesd19	(Dislike)	4.7 (192)	6.9	3.5	19.4/0.000
Compound indicators					
cesd1	(Bothered)*	13.9 (492)	16.2	12.7	7.79/0.005
cesd9	(Failure)†	5.5 (206)	6.5	5.0	3.66/0.06

* cesd1 loads on factor 1 and factor 3.

† cesd9 loads on factors 2, 3 and 4.

however, 'bothered by things' and 'believe life is a failure', loaded on more than one dimension. Nevertheless, there are some significant racial differences. Among African-Americans, the loading for 'hopeful' on the positive affect (life satisfaction) factor is less than half the corresponding loading for Whites, indicating a weaker link between hopefulness and other elements of positive affect. The correlations of positive affect with the other factors are also weaker among African-Americans than Whites.

In Table 3, the prevalence of each CES-D symptom is presented for the sample as a whole and separately by race/ethnicity. African-Americans report more somatic complaints and interpersonal problems than Whites. For depressed affect, the two indicators show weak trends in the same direction. The results for positive affect provide additional evidence that where race/ethnicity is concerned, the 'hopeful' item behaves differently from the other positive affect items. While other indicators of positive

affect do not vary by race/ethnicity, African-Americans are much less likely than Whites to feel hopeful about the future. This percentage difference (11%) is the largest for any indicator in Table 3.

In Table 4, the four depression domains (or subscales) are regressed on the sociodemographic risk factors described above. In light of the ambiguous factor results for the 'hopeful' item as an indicator of positive affect among African-Americans, and its divergent relationship by race/ethnicity (compared with other indicators of positive affect), this item was excluded as an indicator. The regression coefficients in Table 4 are unstandardized, and estimate the change in number of symptoms reported per unit change as a predictor. Each chi-squared statistic tests whether the regression coefficients for a given predictor differ significantly across the four subscales. To eliminate the possibility that differences in scales might confound the results, we rescaled the dependent

Table 4. The effects of demographic and social risk factors on four dimensions of CES-D depressive symptoms: depressive affect (DA); positive affect (PA); somatic complaints (SC) and interpersonal problems (IP).† Coefficients are metric bs indicating the change in the number of symptoms (0–5) reported per unit change in a predictor; N = 3401, weighted data

Outcome†	Stage 1				Stage 2				Stage 3				χ^2/df P
	DA	PA	SC	IP	DA	PA	SC	IP	DA	PA	SC	IP	
Age	0.15**	0.06**	0.12**	0.05‡	0.08*	0.03	0.04‡	0.01	3.59/3	-0.03	-0.13**	-0.03	12.6/3
Afr.-Amer.	0.08‡	0.01	0.17**	0.20**	-0.08	-0.06	-0.03	0.11**	0.13	-0.05	0.02	0.12**	0.006
Female	0.41**	0.02	0.26**	0.06‡	0.37**	-0.02	0.22**	0.05	18.0/3	0.29**	0.10**	0.03	16.7/3
Education									0.000	0.000	0.000	0.000	0.001
Income lt \$6000					-0.025**	-0.003	-0.039**	-0.022**	33.5/3	-0.015**	0.002	-0.023**	20.0/3
Cognitive impairment					0.27**	0.18**	0.27**	0.09*	0.000	0.17**	0.12*	0.06	0.004
Chronic health problems									11.0/3	0.11	0.10*	0.22**	0.33
Disability									0.01	0.06*	0.04‡	0.02	3.92/3
R ²	0.03	0.002	0.02	0.01	0.05	0.01	0.06	0.03		0.30**	0.46**	0.08**	0.41
										0.10	0.03	0.19	0.000

† Depressive affect formed by summing the following indicators: cesd3, cesd6, cesd14, cesd17, cesd18. Positive affect formed by summing the following indicators (and then multiplying by 5.3): cesd4, cesd12, cesd16. Somatic complaints formed by summing the following indicators (and then multiplying by 5.6): cesd2, cesd5, cesd7, cesd11, cesd13, cesd20. Interpersonal problems formed by summing the following indicators (and then multiplying by 5.2): cesd15, cesd19.

‡ $P \leq 0.1$; * $P \leq 0.05$; ** $P \leq 0.01$.

variables prior to the analysis such that each outcome ranged from 0 (no symptoms reported) to 5 (maximum possible number of symptoms reported). The specific items used to code each dimension and the rescaling fractions are given at the bottom of Table 4.

The chi-squared tests in Table 4 indicate that the effects of race/ethnicity differ significantly across outcomes. At stage 1, African-Americans are significantly higher than Whites on somatic complaints and interpersonal problems, but not on depressed affect or (lack of) positive affect. At stage 2, the effect of race/ethnicity on somatic complaints reverts to non-significance when education and income are controlled, indicating that socio-economic status differences account for the increased frequency of somatic complaints among African-Americans. The effect of race/ethnicity on somatic complaints remains non-significant at stage 3 indicating that racial differences in actual health and function have no additional impact on somatic complaints once socio-economic status is added. The effect of race/ethnicity on interpersonal problems decreases by about half but remains significant when socio-economic status is controlled. In analyses not reported, we added measures of social support and negative life events to the model at stage three. Inclusion of these measures did not impact the effect of race/ethnicity on interpersonal problems.

In separate analyses, we tested whether the relationships in Table 4 varied with race/ethnicity. This was done by creating race-by-risk factor interaction terms and adding each to the model. In 28 (seven risk factors by four outcomes) separate tests, there were five significant interactions – more than would be expected by chance alone. Three of these involved positive affect: among Whites but not among African-Americans, females were more at risk on positive affect; the (protective) effect of income on positive affect was stronger among African-Americans; the relationship of disability to positive affect was weaker among African-Americans. Both depressed affect and interpersonal problems were a risk factor among African-Americans but not Whites. As these interactive effects follow no clearly interpretable pattern, and resulted from an omnibus test rather than specific hypotheses, we report them as possible foci for subsequent research.

DISCUSSION

In general, the results of the confirmatory factor analytical analysis replicate earlier findings (Radloff, 1977; Kohout *et al.* 1993) that the CES-D scale items factor into four separate domains: depressed affect; lack of positive affect; somatic complaints and difficulty with interpersonal interactions. Two items, however, ‘bothered by things’ and ‘believe life is a failure’, loaded on more than one dimension. Within race/ethnicity factor analysis demonstrated that, with one exception, the factor structure and pattern of loadings was similar for African-Americans and Whites. The exception was the positive affect factor. Among African-Americans, the factor loading for the item assessing hope about the future on the positive affect factor was less than half the corresponding loading for Whites. In addition, the inter-factor correlations between positive affect and other factors was substantially lower for African-Americans than was the case among Whites. These findings suggest that positive affect, though factoring in a similar way across African-Americans and Whites, may be assessing two somewhat different domains in Whites and African-Americans. Another interpretation is that the relationship between positive affect and depression is modified, that is suppressed, by another covariate not assessed. Specifically, lack of positive affect may be less related to the overall construct of depression among African-Americans and more related to other constructs, perhaps constructs related to the socio-economic environment in which the older African-American lives.

The frequency of depressive symptoms overall in this study was slightly, but not significantly, higher among African-Americans than Whites. Nevertheless, there was considerable variation in the frequency of specific depressive symptoms by race/ethnicity. African-Americans were much less likely to be hopeful about the future than Whites, much more likely to complain of problems with appetite, not being able to concentrate, feeling that everything was an effort and being hesitant to talk. In addition, African-Americans were much more likely to report that people were unfriendly and that they felt themselves disliked by others. They were also more likely to complain that they were more

bothered by things than usual during the past week. Though in this study the Whites and African-Americans reported similar complaints regarding sleep, in another analysis of these data, which included more items assessing sleep, items not included in the CES-D, African-Americans were less likely to complain of a variety of sleep problems than Whites (Blazer *et al.* 1995).

In general, African-Americans were more likely to complain of problems with positive affect, somatic complaints and interpersonal problems than Whites when the four domains of the CES-D were used as 'subscales' and the totals of these subscales were compared by race/ethnicity in crude analyses. In controlled analyses, however, the racial differences disappeared for positive affect when age and gender were controlled and for somatic complaints when education and income were controlled. In a full model, physical disability, income, education and gender are associated with a depressed affect. Disability and income are associated with positive affect or life satisfaction; disability, cognitive impairment, income, education, and female gender and age with somatic complaints; and disability, cognitive impairment, education and race/ethnicity with interpersonal problems. This association of depressive symptoms and domains of symptoms by these control variables is not surprising, neither is it surprising that the crude associations with race/ethnicity disappear when these variables are controlled.

The only domain of depressive symptoms, which varied significantly by race/ethnicity in crude analyses and could not be explained by control variables was interpersonal sensitivity. One must therefore ask the question whether interpersonal problems may tap yet another domain not necessarily related to depression among African-Americans. We have reported on this phenomenon in another paper (Blazer *et al.* 1996). Specifically, these interpersonal symptoms may reflect the effects of real life prejudice experienced by African-Americans not captured by socio-demographic indicators such as socioeconomic status, education and social support.

There are limitations to generalizing from this study. First, the sample derives from community dwelling elders only. More severely depressed elders may be found in acute care settings and

perhaps the symptoms may be different in long-term care facilities. African-Americans in the North Carolina sample use acute care settings as frequently as Whites, but are not as likely to be found in long-term care facilities. Secondly, the CES-D is not analogous to the symptom criteria of DSM-IV or ICD-10. For example, the CES-D does not contain a stem question, as does DSM-IV and the length of symptoms for reporting purposes is 1 week with the CES-D compared to 2 weeks with DSM-IV. Nevertheless, these findings may inform symptom assessment using DSM-IV.

How do these findings inform us regarding potential race/ethnicity bias in DSM-IV? Symptom criteria for major depression will perhaps be unaffected, except for the difference in frequency of sleep problems overall (Blazer *et al.* 1995) a trend not found to achieve significance. Certain symptoms for dysthymic disorder, however, including lower self-esteem and a feeling of helplessness, may vary by race/ethnicity.

In summary, an approach to understanding racial differences in psychiatric disorders such as depression that considers only the overall frequency of symptoms or diagnoses fails to take into account the vicissitudes of racial diversity in the presentation of these symptoms and correlates of these symptoms. Depression is not a unitary construct, but typically clusters into multiple domains. Depressive symptoms are correlated with many control variables in this study: the nature and extent of these associations appear to vary in meaningful ways by domain and race/ethnicity. In this community sample of older adults, the complexity of these relationships is demonstrated.

This study was supported by a grant: NIA Contract # NO1 AG 1 2102 (Established Populations for Epidemiologic Studies of the Elderly/Duke).

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